

CATALPA (*CATALPA BIGNONIOIDES*,
BIGNONIACEAE) AND BOIS D'ARC
(*MACLURA POMIFERA*, MORACEAE)
IN EARLY TEXAS RECORDS

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ABSTRACT

Field notes of pre-1860 Texas surveys in the Texas General Land Office were read and the included data on witness trees collected. This data were analyzed for evidence concerning the indigenous range of three trees: *Catalpa speciosa* Warder, *Catalpa bignonioides* Walt., and *Maclura pomifera* (Raf.) Schneid. Catalpas were named as witness trees before 1860 in only two east Texas counties, Jasper and Newton. Their presence in the surveyors' reports from only these two contiguous counties, with their absence from the thousands of reports from the rest of the state, is advanced as evidence that these two counties make up most, if not all of any Catalpa's indigenous range in Texas. The location of these two counties being at the southeast Texas border seems to indicate that only *C. bignonioides* (the Southern Catalpa) should be considered indigenous in this state. Bois d' arcs appear as witness trees before 1860 in only 12 northeast Texas counties. This is presented as evidence that the native range of *Maclura pomifera* in Texas was probably limited to those 12 counties.

RESUMEN

Se leyeron las notas de campo de los informes sobre Texas, anteriores a 1860, de la Texas General Land Office y se recogieron los datos existentes acerca de los árboles testigo. Estos datos fueron analizados para buscar evidencias acerca del área autóctona de tres árboles: *Catalpa speciosa* Warder, *Catalpa bignonioides* Walt., y *Maclura pomifera* (Raf.) Schneid. Antes de 1860 las catalpas fueron designadas como árboles testigo en sólo dos condados del este de Texas, Jasper y Newton. Su presencia en los informes de los topógrafos en sólo estos dos condados contiguos, junto con su ausencia de miles de informes del resto del estado, se toma como evidencia de que estos dos condados forman la mayor parte, si no el total del área autóctona de Catalpa en Texas. La localización de estos dos condados en la frontera sudeste de Texas parece indicar que sólo *C. bignonioides* (la catalpa del sur) deba ser considerada autóctona en este estado. Antes de 1860 *Maclura pomifera* aparece, como árbol testigo, en sólo 12 condados del nordeste de Texas. Esto se presenta como evidencia de que el área nativa de *Maclura pomifera* en Texas estaba limitada probablemente a estos 12 condados.

More than 50 years ago it came to the attention of some who were studying the history of plant communities that there was a wealth of information for them in accounts of witness trees included in the field notes of

early surveyors. Those surveyors did not have the luxury of leaving permanent markers indicating the points on their lines or of having sophisticated instruments with which to relocate the points, so it was important for them to leave directions enabling those coming after them to relocate the points by using the natural surroundings. To help make that possible it was the early surveyor's responsibility to follow certain instructions of the surveyors-general. Those procedures were outlined by Dodds et al. (1943).

Those directions mandated that the surveyors, after establishing points, were to locate the trees nearest to the points. Those trees were called "witness trees." And it was the surveyor's duty to record in his field notes the direction by compass reading and the measured distance from each point to at least one witness tree, as well as to note the species of that tree and its trunk diameter. Although almost none of those witness trees still survive, the original records of where and what species literally millions of them were are carefully preserved in official files of the governmental land offices of the U.S.

Lutz (1930) was among the first to make use of this material to help determine the original vegetation of an area. Other early studies based to a large extent on the witness tree records were those of McIntosh (1962), Oosting (1942), and Stearns (1949).

There soon was so much reliance on these witness tree records that it became necessary to deal with any possible bias or negligence on the part of the surveyors. Several ways in which they might have skewed their tree records were pointed out.

It is possible that they might have bypassed small trees and chosen only large specimens to mark and record. However, it does not seem that this happened in any significant amount, since I find many witness trees recorded as only 6 inches in diameter; the smallest one in early Texas records was a sapling only 4 inches in diameter. In other places even smaller trees were sometimes used. The 1832 survey of Sumter County, Alabama, includes witness trees down to 2 inches in diameter (Jones & Patton 1966), and it has been stated that, "in exceptional cases, 2 and 3 inch stems were blazed" (Bourdo 1956).

It could be surmised that surveyors might discriminate against short-lived and cull trees, but, since willows, birches, and understory witness trees appear regularly in environments appropriate for them, this does not seem a significant factor. Bourdo (1956) pointed out that the trees selected may be expected to present a complete qualitative list of what was present because "there is a tendency to use an uncommon species . . . because relocation of the corner will be easier."

Some have thought that surveyors, by just not bothering to record trees, might have left an incomplete record of them, but the urge to minimize

labor seems to have kept this from being a significant factor. In most cases any surveyor not finding a tree within reasonable distance from any point was expected to erect a cairn of stones on that point. The time and work involved in doing this would not have been relished, and the fact that I find some witness trees described as being many yards away from their points shows that the surveyors chose to measure quite long distances to trees rather than to laboriously gather stones and erect monuments. And the paucity of cairn records in any but what are known to have been very open deserts or grasslands emphasizes that if there was any tree in the vicinity of a point it can be presumed that it was recorded.

There was sometimes malpractice and even fraud in surveying, resulting in points and lines being misplaced. However, this does not need to concern us, because even though such incorrectly located points introduced errors into land plats, they were still arrived at without regard for existing trees. Bourdo (1956) concluded that "errors of this sort do not necessarily affect the usefulness of the field notes."

Studies based on Texas witness trees came late and have been few, but some workers, such as Harcombe and Marks (1977) and Schafale and Harcombe (1983), used them in reconstructing some of the original forest communities of southeastern Texas.

All these studies have dealt with plant communities on a more or less local and quantitative level. It occurred to me that the witness tree evidence could show a different kind of qualitative reality when viewed from a broader perspective. I therefore embarked upon an attempt to get a general view of the whole of early Texas in its original state as shown by the witness trees the surveyors said were present before significant settler interference with them. Because of the knowledge of on-going processes that caused significant changes in the natural ecology after 1860, I chose 1860 as my cut-off date and used only surveys made up to that date to establish the original scene.

In this study I was able to go through all field notes of the pre-1860 surveys in the general file in the Records Division of the Texas General Land Office, Austin. I compiled data on 153,030 witness trees as described in 22,879 early Texas land surveys. Each survey was located by the Land Office down to the county in which it is presently included. The surveys are on file as official land office records and are available for study in the Texas General Land Office. From these I have therefore been able to make lists of the trees officially declared to have been part of the original vegetation of each present county, and also to make range maps showing the counties in which each species was found growing before 1860 and in which each species can therefore be presumed indigenous.

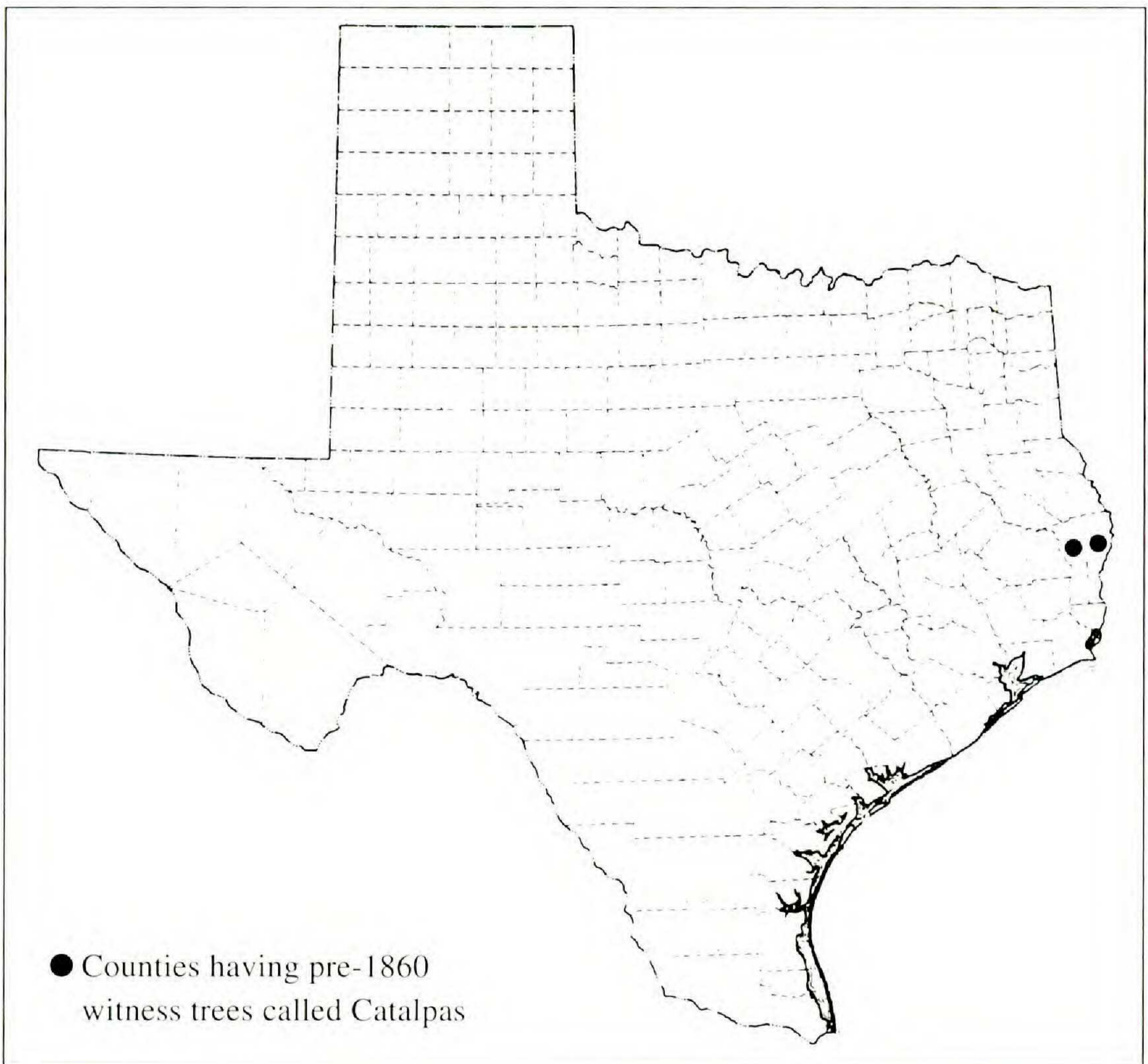


FIG. 1. Texas counties having pre-1860 witness trees called "catalpas."

WITNESS TREE DATA APPLIED TO THE ENIGMA OF TEXAS CATALPAS

Catalpa is the American Indian name for some trees found in scattered locations almost throughout the eastern half of the U.S. That such a word has entered our language as the accepted common name for some trees and that the word has even become the name for the genus indicates that these are indigenous American trees. It is also generally agreed that there are two species of this genus in the U.S. One, *Catalpa speciosa* Warder, the northern catalpa, is indigenous in the central Mississippi River basin, with general agreement that it grew native from at least Indiana and Illinois southwest into Missouri and Arkansas. The other, *Catalpa bignonioides* Walt., the southern catalpa, is thought to have been native from Florida west into at least Mississippi and, according to some, into Louisiana.

But today we find catalpas in scattered locations almost throughout Texas, sometimes planted, sometimes growing wild. So what about the catalpas in Texas today? Are they Texas natives or not? If native, where in Texas did

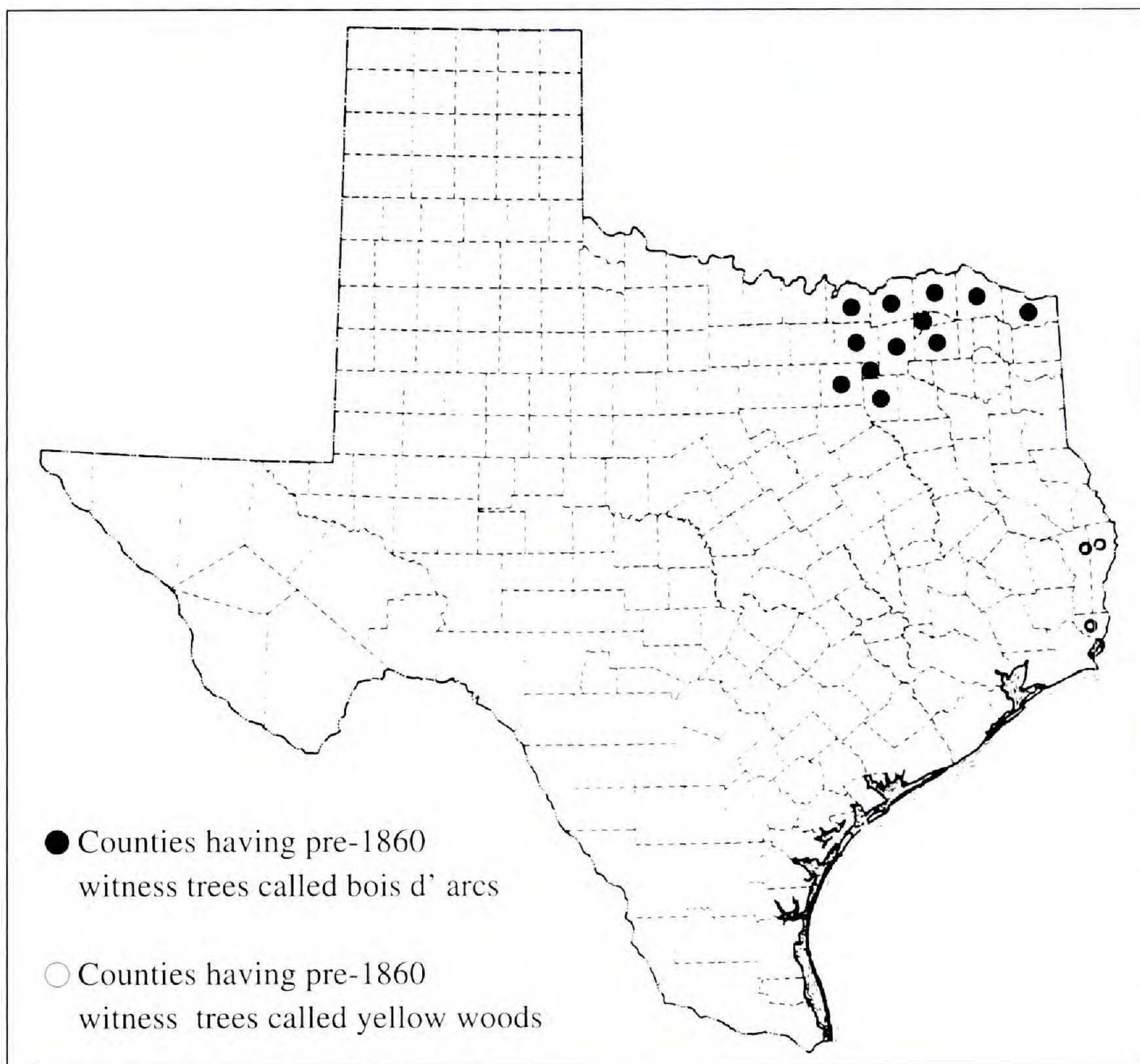


FIG. 2. Texas counties having pre-1860 witness trees called "bois d' arcs" and "yellow woods."

they originally grow? Botanists dealing specifically with Texas leave us with rather uncertain and sometimes even contradictory answers to these questions.

Concerning the northern catalpa, Sargent (1905), writing early, stated flatly that this tree was not native anywhere in southern Arkansas, western Louisiana, or eastern Texas. Harrar and Harrar (1946) gave its range as from "Illinois and Indiana south to Arkansas," thus leaving out Texas all together. A guide to the trees of Texas published by the Texas Forestry Association (1928) says *C. speciosa* "is found naturalized in east Texas," so denying it a Texas origin. Vines (1960) and Correll and Johnston (1970) were noncommittal, dealing only with the tree's present distribution. Simpson (1988), by not even listing it in his guide to Texas trees, makes it clear that he does not consider this a Texas tree. But Shinnars (1958), in his study of northern Texas plants, says the tree is "rare as a native tree in pine belt [of Texas]," although he attributes the statement to Smith (1970).

There is equal disagreement about *C. bignonioides* in Texas. Small (1903) early stated that the tree is native in southeastern Texas. Reeves and Bain (1946) also considered it to be a Texas tree. Vines (1960), however, said it is "thought to be native from Florida and Georgia, westward into Louisiana. Doubtful whether native in Texas." Correll and Johnston (1970) did not commit themselves on the point. Harrar and Harrar (1946) made the definite statement that the tree ranges west only as far as Mississippi, and neither the Texas Forestry Association (1928) nor Simpson (1988) even mentioned this species, these latter three at least implying that the tree is not indigenous to Texas.

So we have the enigma of Texas catalpas. They may both, the northern and the southern, be here today. But is either one indigenous here? Is there any way to determine that from any actual evidence?

The accompanying map shows the present counties of Texas in which catalpas were found and recorded as witness trees prior to 1860. They appear only in surveys of Jasper and Newton counties of that early era. This is significant in several ways.

First, the fact that there was not one catalpa among all of the thousands of trees used as witness trees in all of northeastern Texas, which was apparently the first region of the state to be widely surveyed, makes it highly unlikely that there were any indigenous catalpas in that region of Texas.

Second, catalpas recorded as growing in two counties just within the southeastern corner of Texas at such an early time provide evidence hard to deny that some catalpa is indigenous to that limited part of the state. This is especially true because some of those catalpas had to have been already mature and grand in size when the pioneers first entered Texas. So early as 1838, in listing the forest trees found in Texas at that time, von Wrede (1970) described them in the following words: "Next would be the catalpa tree which is forty to fifty feet high, with a trunk up to three feet in diameter and foot-long leaves which are eight to ten inches wide. Its flower, a pyramid-shaped cluster similar to the horse chestnut, is a magnificent sight."

Third, the absence of any early-day catalpas from all of northeastern Texas makes it highly unlikely that the northern catalpa was native to the state. If those found down in Jasper and Newton counties were *C. speciosa* they would have been a relict population isolated by several hundred miles and a very different environment from the nearest definitely known native stands of that species.

And fourth, those catalpas found growing just within the southeastern border of Texas were separated by no large distance or major environmental factors from the known range of *C. bignonioides*. It would seem to follow, then, that these catalpas must have been the southern catalpa, extending that species' known range just into Texas.

I submit that this is clear and adequate new evidence allowing us to put *C. bignonioides* into the list of indigenous Texas trees but also indicating that we should delete *C. speciosa* from that list.

THE BOIS D'ARC IN EARLY TEXAS RECORDS

The bois d'arc or Osage-orange, *Maclura pomifera* (Raf.) Schneid., has been called "perhaps one of the classic examples of an endemic species in North America" (Smith and Perino 1981). Endemic it certainly is, and as Texan as any, but that does not mean there has been consensus about the tree's natural range in Texas.

Some authorities, for instance Correll and Johnston (1970), have merely made general comments about the tree's being found growing in at least Oklahoma, Texas, and Arkansas but avoid being more specific. Beyond this, statements of its natural range in Texas are widely divergent. Collingwood (1939) claimed the tree was native from beyond the Red and Sabine rivers southwest to at least the Rio Grande and beyond the lower Pecos River. Betts (1953) claimed it was native over all of eastern Texas but the coastal plain and all of central Texas to beyond San Antonio. Burton (1963) drew its natural range as a narrower belt from the northeastern corner of the state down to an arc from about San Antonio on the west to the coastal plain near Wharton. Such ambiguity concerning an endemic species is remarkable, and there must be a reason for it.

The reason for this uncertainty concerning the original range of this tree is that even before the time of first botanizing in this region bois d'arc had already been introduced into new areas far outside its original range. How very early this process was going on is attested to by the remarkable statement of Custis (1984). In his catalog of plants he found in 1806 on the Red River he wrote, "Bois d'arc, of this tree you have already had a description.—it is probably a new Genus . . . it is said first to make its appearance about the 2nd Little river and is very abundant on a creek called Bois d'arc. The tree which I saw was one growing within a mile of Nachitoches [Louisiana] & was probably transplanted.—This is about 30 ft. high; its trunk 7 to 8 ft. in circumference & about 6 to 7 ft. to where it begins to ramify.—its general aspect is that of an apple tree.—its fruit is about the size of the large sour Oranges and of a greenish yellow."

Any tree having attained by 1806 the size described by Custis (1984) must have been transplanted long before, perhaps when there was no one present at that site to do the job except Indians. This may mean ascribing much more in the way of horticulture to the Indians than we would have suspected, but Custis' observation may require it. His editor notes that, "Scattered trees found farther east, in the vicinity of the Caddo settlements, quite possibly were transplanted by the Indians." Simpson (1988) recently

noted that “Bois d’Arc shows up in many places in the Trans-Pecos—always at Indian campgrounds or caves . . . Today, great thickets of Bois d’Arc are found in these areas, seeded from the horse apples carried by these tribes.”

The tree was also carried about by explorers and settlers. In 1804, Lewis (1962) wrote in a letter to Thomas Jefferson that he had sent him cuttings of this plant. Lewis stated that he had obtained the cuttings in St. Louis “from the Garden of Mr. Pierre Choteau . . . [who] informed me, that he obtained the young plant at the great Osage Village from an Indian of that nation, who said he procured them about three hundred miles west of the place.” A huge individual of the species still stands on the grounds of the American Horticultural Association, within sight of the Potomac River. These grounds were once George Washington’s River Farm, and since it is known that Jefferson gave Washington other trees, this individual may be either one of Lewis’s cuttings or a descendant of them. There is also a single equally huge, old bois d’arc in the front yard of the Oatlands Plantation near Leesburg, Virginia. Since Jefferson is known to have visited this home as well, this may be another legacy of Lewis, through the agency of Jefferson. This chain of events emphasizes the remarkably early introduction of this species across the land. The tree proved so useful for living fences that John A. Wright, editor of the *Prairie Farmer*, and others were promoting it actively from the 1850s on.

Such widespread introductions of the tree have erased for all time any possibility of field work rediscovering the limits of the species’ natural range. All we have now is some indication of where each author found it growing in his time. So how, at this late date, can we ever arrive at the true original range of this important endemic tree? I think there is a simple answer, but one involving much tedious research. It is simply to check explorers’ written accounts and field notes from their surveying projects for their testimony concerning where they found these trees before the settlers came in and broadcast them. I have carried out such a lengthy records search for the state of Texas.

To this end I have read all of the surviving material written by people who were in Texas before 1860 that I have been able to locate. This includes eyewitness accounts of many aspects of the region in books, letters, itineraries, reports official and unofficial of exploring and military expeditions, diaries, etc., written by 290 explorers, soldiers, adventurers, settlers, and other pioneers who, up to 1860, experienced and observed the Texas wilderness and took the trouble to write about it. I have not used any reminiscences written at a distance from the observations and so subject to possible errors of memory or the prideful embellishments of old-timers. In

these accounts there are thousands of reports of different trees found growing in those early days in Texas. I have not found any distinct tree species generally recognized as native to Texas that is not reported by at least some of these explorers. And the bois d'arc is there.

Among all those tree descriptions I have found only 14 pre-1860, contemporarily written records of bois d'arcs growing in Texas. The small number of these early bois d'arc reports seems very significant in itself, when compared to the more than 600 separate written records of mesquites appearing in those pioneers' accounts. This alone would seem to promote a healthy skepticism about the hypothesis that the bois d'arc was native to any wide area of the state.

I have also tabulated the data on 153,030 witness trees located and named in early Texas surveys. Of all these thousands of Texas witness trees, only 123 were bois d'arcs. This hardly portrays the species as of any general significance in the original tree cover of the state. And the locations where those naturally growing bois d'arcs were observed further reduces them from state-wide importance.

Map 2 shows the present counties of Texas in which bois d'arcs were named as witness trees up to 1860. The testimony of the early surveyors is that the species was then growing wild in what have become 12 counties: Bowie, Collin, Dallas, Delta, Fannin, Grayson, Hopkins, Hunt, Kaufman, Lamar, Red River, and Rockwall. Because in each of these counties some of these trees were stated to have been large, mature individuals, they must have been indigenous. And although it is impossible to prove a negative, the fact that, in more than 150,000 pre-1860 witness trees from all of the rest of Texas, there appears not one bois d'arc makes for a very strong presumption that this 12-county area was the total original range of this species in the state. This presumption is strengthened by the 14 explorers' accounts of the tree all in the same 12 counties, by the fact that no explorer mentioned the species in any other location in Texas, as well as by the very early naming of two creeks, one draining the upper part of this same area into the Red River and the other running out of the lower part of it into the Trinity River, both as Bois d'Arc creeks. I therefore submit the conclusion that this 12-county area and this alone was the natural range of this species in Texas.

The early records make it clear that the pioneers did not use the name "yellow wood" for bois d'arc but for some other. (What "yellow wood" is cannot be determined from the common name alone. In pertinent literature several species of trees are referred to by that name.) We can see this because, first, no tree found growing within the original range of bois d'arc as outlined above was called yellow wood in pre-1860 writings, and sec-

ond, because all of the yellow woods named previously to 1860 were found over 200 miles from this species' otherwise known range. Map 2 shows the discrepancy in the ranges of the pioneers' bois d'arc and yellow wood.

After reading the explorers' reports I am convinced that we have little conception of how profusely the bois d'arc grew in the center of its native haunts along the creeks named for it, so I add some of their descriptions of this.

In 1805, Sibley (1931) wrote of "a beautiful bayou situated on the left side [of the Red River]" that "the French call ... Bayou del Palo de Arco, Bois d'Arc, or Bow-wood Creek, from the large quantity of that wood that grows upon it, of which the Indians make their bows." Moore (1965) wrote of the "forests of Bois d'Arc" in the same area. Several of the surveyors described what they encountered in these areas as "thickets" of bois d'arc.

There is an especially interesting passage showing incidentally the large amount of bois d'arc that must have been in the area of Collin and Rockwall counties and at the same time showing a strange way in which these trees could have been a danger to travelers. The correspondent of the *Clarksville* [Texas] *Standard*, who signed himself merely as C De M, was traveling from McKinney down the East Fork of the Trinity in 1853 (C De M 1853). When at about the present boundary of Collin and Rockwall counties, his party had to stop for the night because "the creeks upon both sides of the river were overflowed, and although there was a ferry flat at the river, there were none at the creeks, and so we concluded to wait a few hours, as we were told that swimming the creeks might be dangerous from Bois d'Arc brush in them full of thorns—so we waited till morning, and the water rose during the night."

That the thorny branches of this species could be a real hazard and, at least upon Bois d'Arc Creek itself, could form impenetrable thickets is further emphasized by the description of one curious episode. Marryat (1970) wrote that he was struggling to get from the western wilderness to the comparative civilization of Louisiana in 1843, when he experienced the situation which he described as follows: "... after traveling some six or eight miles, we found our further progress cut off by a deep and precipitous chasm, lined with impassable briars. To return was our only alternative, and at noon we again found ourselves near to the point from whence we had started in the morning. A consultation was now held as to our future course ... On the morning of the preceding day we had passed a large, though shallow, sandy stream. Gabriel and I thought it more advisable to return to it. This stream was evidently one of the tributaries of the Red River, and was running in an easterly direction, and we were persuaded that it must flow through the chasm, and enter into the forest ... The next day at noon, we encamped on the stream ... The next morning after break-

fast, we filled our saddle-bags with the remainder of our provisions, and followed the stream for ten miles, with water to our horses' shoulders, as both sides of the river were covered with briars ... For nine miles more we continued wading down the river, till at last the prickly pears and briars receding from the banks, allowed us once more to regain the dry ground."

Anyone who has ever stumbled into and had to extricate himself from a patch of bois d'arc sprouts surely can understand why thickets of these would be virtually impassable and also why they might be called briars. And Nuttall (1980), who first named this species, attested to its growing in just such thickets as described in Texas by writing that when almost directly across the Red River from Bois d'Arc Creek in Choctaw County or western McCurtain County, Oklahoma: "... along the margin of all the rivulets we met with abundance of the Bow-wood (*Maclura*), here familiarly employed as a yellow dye." So I think that we have to make the effort to imagine at least the center of the 12-county range already outlined as a vicious, thorny, almost impassable thicket of bois d'arc instead of the open expanse it is today. Smith (1970) required this of us, having written in 1849, that "he thinks very highly of Reily's lands on the Bois d'arc, although they are covered with the dense thickets peculiar to this creek."

But this plant was not only a thorny shrub. While writing of this same general area in 1840, Moore (1965) gave something of the size of the parent trees: "The Bois d'arc trees attain a remarkable size and are often found four feet in diameter and eighty feet in height." We may class this as among the grandest of Texas' original forest trees, but it seems we should conclude that its natural range in the state was not large.

ACKNOWLEDGMENTS

I thank the Ewing Halsell Foundation and the Robert J. Kleberg, Jr. and Helen C. Kleberg Foundation for their support, which made the research and writing of this report possible.

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